

WHAT IS CLAIMED IS:

- 1 1. A method of analyte identification comprising:
2 receiving data from a plurality of sensor sites formed on an integrated circuit,
3 wherein a sensor material is constrained at the sensor site and has regions of a nonconductive
4 organic material and a conductive material, and in the presence of an analyte, the sensor
5 material has measurable changes in an electrical property;
6 storing analog weights from the plurality of sensor sites; and
7 using the analog weights to identify an analyte.
- 1 2. The method of claim 1 wherein the analog weights are stored in an
2 analog memory.
- 1 3. The method of claim 1 wherein the analog weights are stored using a
2 digital memory.
- 1 4. The method of claim 1 wherein the analog weights are stored using
2 nonvolatile analog memory cells.
- 1 5. The method of claim 1 further comprising:
2 perturbing the analog weights by a perturbation of equal magnitude.
- 1 6. The method of claim 1 further comprising:
2 measuring an output error using a result of perturbing the analog weights.
- 1 7. The method of claim 5 wherein the perturbation has a random sign.
- 1 8. The method of claim 1 wherein the electrical property is resistance.
- 1 9. The method of claim 1 wherein the electrical property is capacitance.
- 1 10. The method of claim 1 wherein the electrical property is impedance.
- 1 11. The method of claim 1 wherein the analog weights are stored in an
2 analog form in a plurality of floating gate device memory cells.

1 12. The method of claim 1 wherein using the analog weights comprises
2 comparing the stored analog weights against a set of analog weights for previously identified
3 analytes.

1 13. The method of claim 12 wherein using the analog weights further
2 comprises:
3 identifying the analyte as one of the previously identified analytes when the
4 stored analog weights are similar to the set of analog weights of the previously identified
5 analyte.

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